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ABSTRACT

The model for teaching reading and writing as integrated processes advocated in this paper is based on a holistic understanding of composing. Psycholinguistics, cognitive theory, and composing research are reviewed extensively in an attempt to clarify their theoretical implications for teachers of composing. Concepts discussed as applicable to an integrated model of teaching composing include the following: (1) reading is as much an act of composing as writing; (2) three types of speech--social, inner, and written--are interdependent and should be synthesized; (3) because learning is functional, the more abstract forms of written discourse must develop from functional intellectual contexts; and (4) because thinking develops by stages, a reader/writer can become more adept at controlling symbolic relationships unbound by the sensory world. (AEA)

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An Integrative Model for Teaching Reading and Writing Based on Recent Research in Composing

Most recent research in composing suggests that teachers of composition replace an outmoded atomistic perspective on their subject with what contemporary information theorists call the "holistic" perspective. Taking a holistic perspective on the composing process means a refusal on the part of teachers to see parts as distinct from whole processes. Seeing composition holistically would mean that an informed teacher would refuse to explain composing by referring to a set of related but distinct steps, each requiring a specific set of writing or reading skills that were generally divided into invention, arrangement, and style or prewriting, writing, and rewriting and editing. In contrast, our ideal teacher would explain composing by setting out a general definition and a set of operations that practicing writers use as they write. Invention, for example, would become a cognitive tool useful in different ways at every stage of composing; it would not be limited to prewriting, as it often is in conventional textbooks and course plans.

How might the holistic understanding of composing help critics and teachers integrate the processes of reading and writing? To answer that question coherently, I shall next review two areas of recent research with the intent of clarifying their theoretical implications for teachers of composing.

I

Psycholinguistics and Composing

In 1908 Edmund Burke Huey produced The Psychology and Pedagogy of Reading, a book that served as a distant and relatively brilliant precursor to the recent work of psycholinguists who have studied the fluent reading process.[1] Huey in 1908 posited the functional tenet of all psycholinguistic approaches to reading: that fluent readers do not decode either to phonetic features or spoken language,

CS205596

rather they use "cues" or dominant features of letter-formation, word recognition, and syntax to trigger a larger comprehension of meaning that, in turn, is used to confirm or disconfirm the initial apprehension of meaning. Cues or dominant features, says Huey, function automatically as we read across a line of print, but "When the total recognition completes itself...we are apt to be conscious of these dominant forms [cues] as the most prominent parts of the word."[2]

Fluent readers, in other words, are fluent guessers. They have internalized certain dominant letter and word features and their eyes move across the page constructing mental patterns from these configurations of selected cues. Then, they at least partially check their guesses at meaning by rechecking the printed features that surround cues at those points in the reading process where the density of texture might make meaning ambiguous.[3]

Current work in psycholinguistics and reading, then, has emphasized what laboratory research has shown us about the human mind as it processes bits of information--in reading, the bits of information would be perceived features of letters and words selected and organized to produce a hypothesis on a passage's meaning--and they have linked this cognitive theory with a generative-transformational understanding of syntax as the bridge between the surface and deep structures of written language.[4] What the psycholinguists and the practitioners who are beginning to base teaching methods on their theories have developed seem almost too simple; yet, it is undoubtedly a far-reaching and seminal concept for any teacher of composing: reading is as much an act of composing as writing. The fluent reader recognizes dominant cues from among a large array of distinctive features that he or she knows but does not--indeed cannot, if we accept the conclusions of laboratory research on letter and word recognition--perceive as distinct features while reading. The reader constructs hypotheses about the meaning of entire passages using prior experience and general knowledge of the context of

the reading and an internalized understanding of sentence patterns; as fluent reading progresses, he or she confirms or disconfirms these hypotheses about meaning by re-scanning difficult or ambiguous combinations of cues and their surrounding features. As Charles Cooper and Anthony Petrosky point out in their review-article on psycholinguistics and reading, "one has to read, make mistakes, and test hypotheses in order to become a fluent reader."[5]

E.D. Hirsch, Jr. recently added social, historical, and stylistic implications to the findings of the psycholinguists.[6] He argues, first, that writing is not to be confused with speech, that it is an essentially different medium--a "grapholect"--rather than merely another dialect, comparable to oral dialects in general.[7] A grapholect includes grammatical conventions, for example, whose norms "are not only more certainly fixed than those of a dialect but are also more widely promulgated than the grammatical norms of any dialect" and its "stability through time" is potentially greater.[8] In Hirsch's early chapters these essentially conserving qualities of written speech are linked with the recognition, long-accepted by rhetoricians and stylists, that writers and readers must re-create the situation implied by the discourse: "The chief problem of written speech as a mode of communication is that a sufficient context for interpretation must be supplied in the absence of the many types of contextual clues found in ordinary speech....intonation, gesture....facial expression--most of all, for its lack of tacit situational understanding and active feedback between speaker and listener."[9]

In summary, Hirsch argues that writing is a more conservative and prescribed medium because it demands from both writer and reader a more creative use of shared psycholinguistic conventions. These conventions--whether lexical, syntactical, or semantic--become the writer's clues to the reader, helping her or him to fill in implied context, to follow the intricate tracking of ideas through a mosaic of syntactical forms, holding meaning as a whole in mind while simultaneously allowing for its revision as the act of reading continues. Just as the

psycholinguists are establishing correlations between reading and creative processes that were previously thought to exist only in the more generative composing activities such as writing, so Hirsch is telling us that both reading and writing demand, together, a control over psycholinguistic processes that are intrinsically different, by nature and medium, from everyday, oral uses of language.

Mina Shaughnessy, in another recent seminal work on composing, takes the writer's rather than the reader's perspective on composing. She, too, emphasizes the essentially conservative nature of the written medium:

> We see then that many syntactic difficulties are rooted in the differences between writing and speaking--in the fact that writing serves a different purpose from speech, that it tends to exploit syntactic possibilities in language that speech either need not or cannot exploit, that it demands coordinations of hand and eye that a speaker does not automatically control and that inhibit the production of grammatically sound sentences...., that it is created through a process that is both more extended and conscious than the process whereby speech is created...., that it removes the writer from the supports of dialogue and puts him or his own in ways that even experienced writers find formidable.[10]

In summary, both Hirsch and Shaughnessy--although working from very different pedagogical perspectives--are saying that the rules, conventions, and--most importanly-- the basic cognitive operations required of writer's are essentially different from those of speech, particularly everyday talk.

Relying himself on psycholinguistic research, Hirsch goes on to establish the concept of "relative readability." Short-term memory in even fluent readers greatly limits their ability to store actual lexical and syntactic items and, in

turn, limits to some degree the amount of time these items can be retained.[11] As a result, Hirsch explains, writers and readers must know whole meanings in at least hypothetical forms before they can either place or find clues to meaning in their texts. Long-term memory cannot store and retain more than a few words or phrases, especially over an extended period of time. What it can do, however, is store whole meanings that are not linguistic by picking up on essential clues, whether lexical, syntactical, or semantic. Written texts then, contain semantic intentions that writers have had in mind as they wrote, and they contain degrees of readability that derive from the clues that writers place in their texts. These clues then allow readers to develop their own senses of a text's semantic intention, which, in turn, becomes a working semantic hypothesis as the reading process is completed. By picking up lexical, syntactic, and semantic clues as reading progresses, the reader either confirms or revises his or her hypothetical sense of semantic intention until it squares with the text. The reader, literally and cognitively, re-conceives the author's meaning, following the empirically-defined processes of psycholinguistic theory.[12]

Perhaps a physical analogy, however imprecise, will help here. The reader follows a trail laid by a writer, picking up different kinds of clues along the way. Both reader and writer almost always have some very general idea of the trail's destination even as they begin. And they both have a working knowledge of how these verbal trails are made and marked. But within these shared general directions, the path could be remade in endless ways. Further, whatever changes in direction occur do not qualitatively change the path_maker and path_finder's general sense of destination.

Psycholinguistic theory, then, can contribute to our model of composing in three ways:

1. It tells us that fluent writers are always making tentative hypotheses and confirming or revising them according to what they discover in the clues they place in their own writing. This is probably what Forster meant when he said that he could not tell what he meant until he had seen what he had written. Writers, then, are always reading, discovering, and rewriting.
2. Readers, in at least a restricted sense, are always writing; at least, they are following cognitive processes similar to those of the writers who produced what they are reading. They make, test, revise hypotheses, working with clues form the text.
3. If points one and two are valid, then the teacher must find, define, and exploit those points in this shared process that can be used to reinforce one another, and they must suggest to students cognitive operations that will help them develop and control the use of clues within defined frameworks of meaning.

II

Cognitive Theory and Composing

Psycholinguists show us just a bit of the mental mechanics of reading, focussing on observable phenomena such as eye fixations and deviations of focus during the reading process, and they develop hypotheses about reading that combine the findings of this empirical research with linguistic (particularly transformational grammar and syntax) and cognitive theory.[13] Information theory, with its attention to bits of information and the mathematically-explained operations of the human mind in processing information into meanings

also plays a large part in what the psycholinguists say about acts of composing. In general, information theory tells us that our minds function as enormously complex computers, enabled by genetic, cultural, and learned skills to impose structural configurations on reality that, in turn, help us process what we see, hear, and feel by enabling us to categorize similar meanings in increasingly complex forms.

Still another empirically-researched field, what Jean Pieget has called genetic epistemology, connects the work of psycholinguists and information theorists with other important research questions.[14] How, for example, are the genetic and environmental aspects of mental development integrated as children learn and develop? What processes can be explained mathematically as universal to the development of thought and to what degree can these processes be reinforced by particular mental operations? What theory of mental development have Piaget and his Russian counterpart Lev Vygotsky given teachers of composing, and how might that theory be used?[15] Will the understanding of how composing develops from thought-processes in general give teachers an organizing foundation for developing pedagogical strategies and activities?

We are far from having definite answers to these questions. But Piaget does provide us with the general theory of equilabration, which can serve the needs of the writing and reading teacher as well as any cognitive model. Children learn, he says, by balancing the intrusions of the social and physical environment with their innate need to conserve internal structural systems.[16] Learning to think, then, is an integrated and recursive process in which the structural capacities of mind and nervous system combine with the socializing and language-learning processes in a sequence of developmental stages. Piaget describes the child's development in four general stages: 1) that of sensorimotor coordination (0-2 years) in which the beginning of thought is accomplished through the playful creation of perceptually-related schemata of sensory data

that the children always relate back to themselves as points of reference; 2) that of pre-logical thought (3-7 years) in which the child develops the symbolic function through play, by deferred imitation, sensory classifications, and indirect representations of objects through language; that of concrete operations in which, by internalizing actions that were previously always physically acted out between subject and object, the child creates abstract groupings that are related to immediate situations but include the mental processes of conversion (comprehending that objects can retain basic properties despite different perceptual forms--for example, that the same amount of water can exist in different perceptual form in either a short and fat or a tall and skinny glass), reversibility (for example, that a tied-shoe can be untied by reversing the process of tieing), and classification (groupings of objects and abstractions such as rules, but without the complex relations among items in the groups that are possible later); and that of logical thought or what Piaget call "hypothetico-deductive reasoning" (7-11 years) in which concrete operations become logical as the child develops intersecting systems of abstractions that are combined by propositional operations. The child's actions are now more conventionally "mental," as he or she manipulates sensory objects and ideas by transforming them into new sources of knowledge. Of course, different social and environmental influences alter the model for each individual, but it always functions according to similar principles and operations.

Thinking, then, follows the development of ways of knowing. Learning, in turn, is as much an epistemological as it is an ontological process. With each stage, children progress from egocentric modes of using symbols to relate all senses back to themselves to a process in which external intrusions are recognized and accommodated. Symbolic operations help the child assimilate

the objecti e world to his own mental structure, and they help accommodate the child's perceived world and its structures to the objective world. Knowing the world becomes an intricate balancing act between the subjective and objective, the structures of mind and the structures of reality actively influencing one another.

Piaget's earlier research had hypothesized a single period of egocentric thought ranging throughout childhood, diminishing gradually and eventually being replaced by adult logical thought. He based his belief in the existence of the child's cognitive egocentrism on his observance of egocentric speech, a kind of speech in which the points of view of other individuals were excluded and all objects, sayings, and ideas were related back to the speaker's perspective.[17] Egocentric speech was to Piaget evidence of a stage in which the child moved from purely sensorimotor uses of language to the more abstract and decentered speech of adults. It was reflective of a mental development from simple object-oriented talk to mature thinking and speaking, as influenced by social interaction on one side and the logical structures of the mind on the other.

Vygotsky turned this around and posited a process developing from purely sensorimotor manipulation of symbols very early in childhood followed by a branching off into social and inner speech thereafter. What Piaget called egocentric speech was, to Lev Vygotsky, not a simple transition from autism to socialization, but a sign that the child's earliest object-bound speech was going partially underground and becoming a somewhat sophisticated form of interior monologue.

> Our findings indicate the egocentric speech does not long remain a mere accompaniment to the child's activity. Besides being a means of expression and of release of tension, it soon becomes an instrument of thought in the proper sense--in seeking and planning the solution of a problem.[18]

Children talk to themselves not solely because they do not care about audiences and their viewpoints, but because they are giving themselves directions in developing integrated, conceptual solutions to, first, situational and, then, abstract problems. Thus we have a developmental process in which a new type of semi-conscious autism follows rather than predates later forms of social speech and the early forms of thought.

James Britton best summarizes the general implications of Vygotsky's research when he describes the evolution of social and inner speech as simultaneously originating in the sensorimotor, egocentric thought and speech of infancy and then developing on two parallel but distinct tracks. Social speech, from 3-7 years, works toward communication; it is more detailed and directed toward an audience, and it shares more completely in the linguistic cues and conventions of language as we use it in socially-functional contexts. Inner speech, from 3-7 years, works toward the solving of functional, then logical, problems for the individual; it is not directed toward an audience, but it most decidedly does include, even in its early developmental stages, most of the elements of mature, logical thought.[19] Vygotsky defines its linguistic properties as ellipses (particularly the omission of those nouns and pronouns that are constant to the monologue), an emphasis on predication (on the connecting and relating elements of language), a general emphasis on whole meanings rather than the specifics of lexicon and syntax, and the use of large numbers of word combinations that are understandable only to the speaker because they bring together word connotations that are related to the speaker's mental processes rather than to external referents.[20]

In secondary and college-level writing classrooms, then, teachers of reading and writing are faced with the problem of synthesizing three types of speech: the social speech defined by Vygotsky and Britton and distinguished

as very different from written speech by Shaughnessy and Hirsch, the inner speech defined by Vygotsky and Piaget and correlated more closely with the development of thought by educational theorists such as James Moffett, Jerome Bruner, and James Britton; the early experiences with school writing, reading, and discourse.[21] All three forms of speech are interdependent; all three have surface structures and conventions of their own; all three share universal cognitive structures. Just as all people use basic cognitive structures and operations to develop species-similar modes of thought, so teachers must search out the relationships between these forms of speech, the operations that are used to develop them, and the operations that can be developed to connect the effects of thinking in general with the specialized concerns of writing and reading, the media common to mature intellectual life.

Cognitive theory, as defined by Vygotsky and Piaget and applied to language teaching by Britton, contributes these additional points to our evolving model of composing:

1. It adds inner speech to our consideration of what early and late adolescents bring into a composition class (along with social speech and previous academic experience).
2. It reminds us that <u>all</u> thinking not just reading and writing--develops through a balancing process in which internal cognitive structures, shared by all to one degree or another, actively help learners to assimilate elements of the external world and accommodate the external world to their ongoing intellectual life. Reading and writing are themselves simply specialized versions of this general intellectual development. Composing, then, becomes the center of intellectual life.
3. It helps clarify the structural differences among inner speech, social speech, and mature reading and writing. These differences

can then become the bases for developing operations that will help students as they attempt to transfer thought from inner and social speech to reading and writing.

4 Both Piaget and Vygotsky remind us that learning is always functional. It begins in concrete operations in relation to objects and people, and it progresses through either external or internal symbolic action, either verbal or nonverbal. Genetic experiments have correlated the adaptive functions of biology with the learning processes described by human psychology. Even the most abstract forms of thought are grounded in our innate and learned propensities to act on the world through and with symbols.[22] The more abstract forms of written discourse, then, must develop from symbolic action, from functional intellectual contexts.

5. Finally, genetic epistemology emphasizes that thinking develops by stages. Each stage completes a process of assimilation and accommodation and establishes the ground for the next. And the three general stages of cognitive development work toward similar interlinkings of cognitive operations: sensorimotor activities result in egocentric speech and thinking in purely sensory "heaps"; prelogical thought progresses from complexes through chains that are always founded upon sensory experience; logical thought develops when early adolescents become able to use concepts that are the result of complex interworkings of whole symbolic systems.[23] In each general stage, the thinker becomes more adept at controlling symbolic relationships that are not bound by the sensory world.

Footnotes

[1] Huey's book (1908) and Cooper and Petrosky article as excellent summary-review-pedagogy article. (from "A Psycholinguistic View of the Fluent Reading Process," Journal of Reading, Dec., 1976, 184-207 and Edmund Burke Huey, The Psychology and Pedagogy of Reading, Cambridge, Mass., MIT Press, 1968)

[2] direct quotation from Huey (see Cooper and Petrosky, p. 186).

[3] put in my own quote on the applicability of psycholinguistic models to fluent but not beginning learners (see Cooper and Petrosky, p. 187).

[4] mention Smith, Goodman, Levin and Gibson, Levin and Williams as best anthologies on recent psycholinguistic research and reading.

[5] direct quote from Cooper and Petrosky, p. 191. Perhaps say a bit more on how the following list of assumptions about the reading process work from this article as well.

[6] The Philosophy of Composition (Chicago: The University of Chicago Press, 1977), pp. 92-137. These pages cover Chapter Five of the book, where Hirsch relates his concept of "relative readability" to the function of short and long-term memory in the reading process.

[7] Hirsch takes the term "grapholect" from sociolinguist E. Haugen, "Linguistics and Language Planning," in Sociolinguistics, ed. W. Bright (The Hague, 1966), 50-71.

[8] The Philosophy of Composition, p. 44.

[9] The Philosophy of Composition, pp. 22-23.

[10] Errors and Expectations (New York: Oxford, 1977), p. 87.

[11] George A. Miller, "The Magic Number Seven, Plus or Minus Two," in The Psychology of Communication, ed. by George A. Miller (New York, 1967). This is the seminal article on the capabilities of short-term memory. D.E. Broadbent, "The Magic Number Seven," Studies in Long Term Memory, ed. by A. Kennedy and

A. Wilkes (London, 1975) suggests that the number of items capable of being stored is closer to five than seven. See The Philosophy of Composition, p. 111.

[12] E.D. Hirsch, Jr., Validity in Interpretation (New Haven: Yale, 1967), pp. 24-27. Here Hirsch explains the process of re-cognition as it applies to interpretation, which he borrowed from Emilio Betti, Teoria generale della interpretazione 2 vols. (Milan: Giuffre', 1955), 1, 343-432.

[13] Frank Smith on how many fixations of the eye can possibly occur during scansion of a line of print.

[14] Three books best set forth the results and implications of Piaget' research: The Language and Thought of the Child (New York: Harcourt and Brace, 1926); The Construction of Reality in the Child, trans. by Margaret Cook (New York: Basic Books, 1954); Six Psychological Studies, trans. and ed. by David Elkind and Anita Tenzer (New York: Random House, 1967). Elkind's introduction to Six Psychological Studies provides a clear and generally-accurate overview of Piaget's work (pp. v-xviii), dividing it into three general themes--logic, relativity, and dialectics: "....logic....provides the common genotype of the mental, biological, and physical sciences. Relativity expresses the structure of the mind-reality relationship, while dialectic equilibration provides the dynamic or growth principle which governs both the acquisition of knowledge and the structures necessary for this acquisition" (p. xiii).

[15] Vygotsky's research and theory are described in Thought and Language ed. and trans. by Eugenia Hanfmann and Gertrude Vakar (Cambridge, Mass.: M.I.T. Press, 1962); James Britton's work with Piaget and Vygotsky is set forth in Language and Learning (Coral Gables, Florida: University of Miami Press, 1970).

[16] Elkind, in his introduction to Six Psychological Studies, describes three broad phases in Piaget's career: the early, in which he attempted to relate ancient systems of thought with the thought-processes of children to demonstrate

the "partial constancy" of thought over enormous ranges of time; the middle, in which Piaget studied his own children to establish a relationship between universal structures of knowing and the sensorimotor coordination of infants; the later, in which Piaget followed the development of mature logical thought from early childhood through adolescence (pp. vii-viii).

[17] See Chapter 1, "The Functions of Language in Two Children of Six," The Language and Thought of the Child for Piaget's most detailed early discussion of egocentric thought and speech.

[18] Vygotsky, p. 16.

Vygotsky, p. 22.

[19] Language and Learning (Middlesex, England: Penguin Books, 1970), pp. 59-64.

[20] Vygotsky, pp. 143-145.

[21] See James Moffett's Teaching the Universe of Discourse (Boston: Houghton Mifflin, 1968) and Jerome Bruner's Studies in Cognitive Growth (New York: John Wiley, 1966).

[22] Vygotsky argues the functional position on pp. 14-20 of Thought and Language. Piaget devotes all of Chapter One of The Language and Thought of the Child to the functional sources of egocentric speech, and he returns to his defence of theoretical functionalism in almost all his work (See particularly "The Development of Object Concept," Chapter 1 of The Construction of Reality in the Child, where Piaget establishes the functional basis of all sensorimotor thought and egocentric speech in the infant.).

[23] Vygotsky succinctly summarizes these general stages on pp. 58-69 of Thought and Language.